

Fall Shorebird Surveys Citizen Science Program

The purpose of the Fall migration survey is to:

1. Monitor trends in population size.
2. Monitor shorebird use at stopover sites.
3. Determine distribution, abundance and habitat use.

New Jersey Audubon together with the NJ DEP Endangered and Nongame Species Program undertook surveys migrant shorebirds in the fall of 2003. Counts were made from early August until late October. The surveyed sites included only areas south of Brigantine. This year we are expanding on these surveys with the help of Citizen Scientists.

Our fall migration survey ties into several other similar efforts that already exist or that are being initiated to survey shorebirds during migration. One of these, the International Shorebird Survey (ISS) was started in 1974 by the Manomet Center for Conservation Sciences. ISS data helped spark the formation of the Western Hemisphere Shorebird Reserve Network (WHSRN) and have been used to identify sites in North and South America that qualify for WHSRN site designation. Another survey, the Maritimes Shorebird Survey (MSS) started in the 1970's and covers areas in Southeast Canada. We will follow methodology similar to the ISS and MSS. Our survey will also follow guidelines set forth by the "Program for Regional and International Shorebird Monitoring" (PRISM), a program being implemented by a Canada-U.S. Shorebird Monitoring and Assessment Committee. PRISM is based on the shorebird conservation plans recently completed in Canada and the U.S. and provides a single blueprint for implementing both of these plans.

Fall Shorebird Survey Methodology

Objectives:

- 1) Count the numbers of birds of different migratory species using coastal beach/inlet areas or Delaware Bay mudflats.
- 2) Determine the number of adults and juvenile birds of target species: Red Knots, Ruddy Turnstones, Sanderlings and Semipalmated Sandpipers. Determine the number of adults and juvenile birds of other species if time allows.
- 3) Record levels of disturbance at the site to determine what types of disturbance and how much of each disturbance has a negative effect on the birds.
- 4) Make behavioral observations of the birds to determine whether they utilize a certain site mostly for feeding, roosting, etc.
- 5) If possible, scan flocks to identify color-marked shorebirds, especially Red Knots, Semipalmated Sandpipers (second priority - Ruddy Turnstones, Sanderlings).

Survey Frequency and Timing

We will follow a modified ISS protocol (below):

The survey period for fall counts in the ISS program runs from the 15th of July through the 31st of October. Our request is for one count to be made each third of the month throughout the survey period.

Survey the site once each third of the month from July 11th to October 31st. In other words, one count between July 11th and July 20th, one count between July 21st and July 31st, one count between August 1st and August 10th, etc. If you can continue the counts into November we would be delighted. Counts should be conducted at least 5 days apart. In other words, please do not count on 20 July for the first survey window and then on 21 July for the second survey window.

Ground counts of shorebirds at non-breeding sites

We will provide information on each site, including a general description, directions to the site and specifics on site access. In addition, at a given survey point, we will determine whether binoculars or a spotting scope would be more appropriate or useful, and recommend this in our site description. Further, we will determine the best tide level for the site to be surveyed (in most cases high tide.)

Recording preliminary data

- Observer name
- Date
- Time
- Name of the study site and county
- Tidal or inland water level
- Weather conditions (optional)
 - Wind speed/direction (optional)
 - Sky conditions/precipitation (optional)
 - Temperature (optional)

Shorebird identification

Volunteers will be trained to become familiar with the key characteristics that distinguish all focal species, with the expectation that most volunteers will be experienced birders. Knowledge of shorebird migration timing, general habitat preferences, sizes/silhouettes and morphometric proportions (e.g., ratio of wing to tail length, or body to leg length), and postures/feeding styles and other behavioral information is extremely helpful and will be included in the training materials. On occasion birds may need to be lumped into some sort of category. (For example, counts for Long- and Short-billed Dowitchers, and for Lesser and Greater Yellowlegs, are frequently combined because distinguishing them under most field conditions can be difficult even for the most-experienced biologist or birder. Vocalizations, however, can provide definitive identifications; so become familiar with their calls as well.)

Counting flocks

Counting shorebirds is accomplished by either directly counting individuals of each species present at a roost site or through a feeding area, or estimating if numbers are in the thousands.

Direct counting

This method can be used in ground and boat surveys. If the flock is smaller than about 3000 birds --suggested number, figure out what you are comfortable with--, a suitable vantage point should be located and all the individual birds should be counted directly using binoculars or a telescope. This becomes progressively more difficult with large numbers, smaller birds and greater distance. For this method it is important that

- There are small numbers of birds, little disturbance, limited movement of birds.
- The observer is far enough from the birds so as not to disturb them.
- The observer avoids walking directly towards the flock as this might make them fly.
- The observer should try to count the birds with the sun behind, so that the patterns and colors of the different species can be seen clearly.
- The observer should not walk along the “skyline” as he/she will be silhouetted and this might scare the birds. The observer should try to blend in with the environment as much as possible.
- The observer should remain quiet and avoid sudden movements that scare the birds.

Estimation methods

As numbers of birds in the area increase estimation methods need to be used. These methods can be used from the ground or from boats.

Estimation procedures should be used if:

- There are large numbers of birds present (more than about 3000, or less depending on experience, type of site being surveyed and bird behavior).
- The birds are continually in flight.
- There is much disturbance.
- The birds are very tightly packed in a roost site.

This method involves counting or estimating a ‘block’ of birds within a flock, e.g. 5, 10, 20, 50, 100, 500, 1000 birds depending on the total number of birds in the flock and the size of the birds. To do this, count a small number of birds (e.g., 10) to gain a sense of what a group of 10 birds “looks like.” Then count by 10s to 50s or 100 birds to gain a sense of what 50 or 100 birds “looks like.” The block is then used as a model to measure the remainder of the flock. After you have a sense what block of birds look like, count by 50s or 100s to 1000 birds, and so on until you have counted all the birds visible from your survey point.

To do this, either using binoculars or spotting scope, pan across the area occupied by the birds. Starting at say the left hand side of the flock, count how many are in one field of view, then move the view to the right and assess if a similar number are in that view. Continue moving to the right and determine how many views the whole flock use, then multiply the first assessment by the total number of views. For example, suppose you find a flock of Red Knot spread over a roost site of 150m. You position your binocular view at the left hand side of the flock and count 120 birds in the first view. You then pan to the right and find that 10 fields of view account for the majority of the flock and that the density of birds in each of the ten views is similar (naturally some views will have higher and lower density). The whole flock can be assessed as 120 birds multiplied by 10 views equaling approximately 1200 Red Knots. Again, experience will increase your ability to use this method. For best results, always try and have the birds you are assessing with the sun either behind you or to the side. It is always difficult to count or estimate bird numbers if you are looking into the sun since its light will glare off the water and mud. To gauge how your experience is growing, always use and compare the direct counting and the assessment methods where practicable!

Landmarks can be used to break up large flocks into more manageable sections. If possible counts should be repeated several times and another observer's opinion obtained on the number of birds before it is written down. **Remember to indicate the accuracy level of your counts, ie. actual count (*), systematic estimate like that just described (**), or a 'guesstimate' (circle)**

With large flocks of different density the accuracy of estimation will not be the same. For example in large flocks which are widely spread it may be possible to count the birds in flocks, and the large spread can give the illusion of larger numbers than actual. In flocks that are closely packed the estimation method is more difficult and the smaller area of the flock may give the impression of smaller numbers.

Many shorebird observers prefer to count birds at high tide roosts. This is simply because a number of species often congregate in a few discrete locations along or adjacent to the estuary as described in the critical habitat section. It can be logistically more efficient to estimate estuary populations using this strategy, especially if a boat is unavailable to explore the estuary at low tide. Shorebird counts at roosts are made 2 hours either side of high tide. As the tide begins to ebb, shorebirds disperse from roost sites to their preferred foraging habitat and this can greatly increase the amount of time and effort required to assess the population.

Small roosts (a few hundred birds) can usually be counted from a suitable vantage point. Larger roosts, and those comprised of the smaller species are more difficult to count accurately, and considerable care must be taken when arriving at totals. Count the stationary birds while they are roosting at high tide, repeating the counts several times. This is the best method as long as the birds are not tightly packed, as is the case for smaller species like Red Knot, Sanderling, and Semipalmated Sandpiper.

When similar species cannot be distinguished from each other it may be necessary to extrapolate species numbers by “sub-sampling”. Sub-sampling first entails estimating the overall percentage of each species in the group. To estimate percentages, choose several subsets of birds across the group (stratifying by habitat or water depth if necessary), then count and identify all individuals within those subsets (recording your numbers by species) and average the percentages for each species or size class across all subsets. Then use the resulting percentages to extrapolate numbers of each species or size class for the entire group. For example, in four subsets of 30 peeps each, you counted a total of 12 Least Sandpipers (10%), 72 Semipalmated Sandpipers (60%), and 36 White-rumped Sandpipers (30%). If your total count of peeps across the entire group was 2000, your extrapolations to all 2000 birds would yield 200 Least Sandpipers, 1200 Semipalmated Sandpipers, and 600 White-rumped Sandpipers for the entire segment.

When you report, report 1880 Peep AND your actual counts of the identified species!

Proportion of adults and juveniles in flocks

After the numbers of each species have been counted, determine the proportion of juveniles to adult birds in a flock (prioritize: Red Knots and Semipalmated Sandpipers, Sanderlings, Ruddy Turnstones). When scanning a flock to count adult and juvenile birds, the following quantitative method should be used.

Scan in one direction through a flock, counting individual birds as you go along; when a juvenile is encountered, record the bird’s number; that is “1, 2, 3, 4, *bird 5 juvenile*, 6, 7, 8, 9, *bird 10 juvenile*, 11, 12” and so on until the flock flushes or is completely counted. The total number of birds counted before they flush minus the number of juveniles detected, gives the total number of adults. This is divided by the number of juveniles to determine the adult/juvenile ratio.

The reason for counting this way is because there are likely to be many fewer juveniles than adults. If the ratios are reversed (unlikely) one can count individual birds and when an adult is encountered, record the bird’s number.

IMPORTANT: the critical determination for this method is the number of juveniles relative to the number of adults in one scan (the proportion of juveniles to adults). It is not critical to count through an entire flock (flocks will flush or change direction causing you to lose your place).

When doing the proportions count, please do not count the flock first and then go through a second time and count the number of juveniles. (The flock may flush and you won’t be able to determine the total number of juveniles in the flock.)

You must record each count as a separate count. If a flock flushes, you can start the count over as a new count, but do not try to pick up where you left off, and do not throw out the first count. It is valid data.

Count as many different flocks as you can.

Recording disturbance and bird behavior

Human activities on coastal habitats alter the way the birds can use these habitats. The impacts of this disturbance vary depending on the type and the intensity of the disturbance. Generally, fishing is a lower impact activity than walking, and they are both lower impact than jogging. Vehicles and boat traffic can have an even greater impact than any of the above activities.

We want to collect data on both human disturbance and bird behavior. In addition to correlating the two, this type of info will allow us to correlate site use to human use and to further explore for what purposes the sites are used by the shorebirds.

Data to collect during the survey:

Disturbance

Count for the entire time period of the count.

- Number of people within 100 m (300ft) of the birds
- Number of vehicles
- Number of dogs
- Number of boats

Behavior

Scan a sample of the birds during the count for numbers of individuals, or count total number of birds involved in each of those activities

- Feeding
- Roosting
- Flying
- Other

Please record whether you were able to count all birds or whether you estimated the number of birds involved in various activities through extrapolation.

Shorebird count ethics

1. **Record only what you know to be accurate.** Use your instincts to guide your field work, but don't let gut feelings get into your data.
2. **Err on the side of caution.** If a situation or an area feels unsafe please do not census.
3. **Do not trespass on posted land.** Remember, while censusing in suburbia, home owners may get upset if they see you aiming binoculars towards their homes. Please be sensitive to land/home owners.
4. **Beach nesting bird colonies are not to be entered.** If you are counting shorebirds in a fenced off area with breeding beach nesting birds, please complete your counts from outside the fence.
5. **Migratory birds are protected by federal and state laws.** Do not harass the birds; do your counts from a large enough distance that their behavior is not affected by your presence.
6. **Honestly evaluate your birding and surveying skills.** State your level of comfort with species identification and count accuracy. There is work for all levels of experience, and if you let us know your weaknesses we will know what additional training to provide.